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## INSECTS INJURIOUS TO DRUGS.

BY WILLIAM EDWIN SAUNDERS, PH. G.

[From an Inaugural Essay presented to the Philadelphia College of Pharmacy.]

In this paper is given simply what has been noted by the writer during a study of these insects extending over more than a year.

*Sivodrepa panicea*.—This is the elliptical, reddish-brown beetle, about one-eighth of an inch long, which is found in almost every edible drug, and in some, such as aconite root and capsicum, that would be pronounced far from edible. In addition to these two drugs, I have found it in bitter almonds, sweet almonds, angelica, boneset, calumba, chamomile, chocolate, coriander, dandelion, elm bark, ergot, extract of licorice, German chamomile, orris root, prince's pine, rhubarb, squill, and sweet flag.

The larva is white, with a brown head, is about twice as long as the beetle when full grown, although it is seldom or never seen stretched out at full length, always remaining curled up in a ball. It will in time fairly honeycomb a piece of root with small holes about one-twenty-fifth of an inch in diameter, at the end of which it is generally to be seen at home. Under the influence of camphor, these larvæ become uneasy, but being apparently unable to crawl away, resign themselves to their fate, and seem to thrive just as well with camphor as without it.

*Calandra remotopunctata*.—This is a small, black beetle, about the size of the last, with what is popularly termed a "snout," projecting from the front of the head downwards. Under the microscope the back, thorax, and head are seen to be finely pitted, giving the insect a rough appearance. It was found in large numbers, the larva feeding on pearl barley, inside of which it lives, the egg being probably laid in the grain by the parent, and on hatching, the little insect makes its home there, eating all but the shell, and sometimes attacking the grain from the outside.

*Tenebrioides mauritanica*, a species of "meal-worm," was found in pearl barley, and one specimen in calumba. It is a dark brown beetle,

five-sixteenths of an inch long, the head and thorax forming nearly half the total length, and the mouth being fringed with hair. The back, which at first sight appears perfectly smooth, proves to be, when examined under the microscope, longitudinally corrugated. The larva is nearly half an inch long, white, with a brown head, and between the jaws is a row of hair as in the perfect insect. The posterior end is furnished with a pair of claspers.

*Trebolium ferrugineum* is a flat, reddish-brown beetle, about one-eighth of an inch long, appearing smooth to the naked eye, though the microscope shows the back numerously pitted. These insects affect patent foods and similar substances, and the beetles are possessed of remarkable longevity, as proved by the fact that I have kept a few alive for two months in a small box with a little ceralina, which seems to be their favorite food. Whether the beetles themselves eat it or not I do not know, but they certainly have a liking for the dead bodies of other beetles.

*Silvanus surinamensis* is a narrow, brown beetle, almost one-eighth of an inch long, with a pitted and longitudinally corrugated back. One specimen only was found, on anthemis.

*Anthrenus varius*.—This insect has been found only in cantharides, but I believe, also attacks other animal drugs, such as castoreum. During the month of July there emerges from the egg a very active larva, densely covered on the tops of the segments with stiff brown hairs, which, at the posterior end, point towards the centre of the back, forming a ridge, and when the insect is annoyed, it has the power of dividing the ridge in the centre and throwing it down on each side in a fan-like position, the object of which movement could not be determined. When the insect has been feeding on the whole cantharides, all these hairs on the back become rubbed off, those forming the ridge being generally last to go, because, being on the downward slope of the body, they are not exposed to the same amount of friction. Underneath, however, the hairs are shorter, and do not become rubbed off as on the back.

The larva consists of eleven segments, those at the ends being of a much deeper brown than those towards the middle, and the six legs being inserted on the three anterior segments, each furnished with a short, straight claw. The skins are shed quite often during the larval state, and are discarded by a slit nearly the length of the back, terminating indifferently at either end, and through which the insect emerges. The shed

skins present a beautiful iridescent appearance under the microscope when viewed by reflected light.

These larvæ feed on the cantharides all winter, and if in quantity, commit great havoc, leaving only the hard exterior portions untouched, such as the upper portion of the thorax, the green wing cases, and transparent wings. When their legitimate food gives out they have no compunction about first eating their dead parents, and then each other, but on this diet they do not seem to thrive so well.

The beetle emerges in May or June, and is about one-eighth of an inch long, oval and black, the upper parts being marbled and streaked with whitish and rufous, which are rubbed off after death if the insect is subjected to any rough usage.

Camphor does not kill these larvæ, and after keeping some for a day in a small box about a quarter full of camphor, the only thing worthy of remark in their actions was that they did not seem quite so lively as those kept without it. That they have a distaste for it, however, is proved by the fact that some which were put in a box with holes in it, left the box during the night. The Pharmacopœia direction to keep camphor with the cantharides is, therefore, not a *remedy*, merely a preventive measure, and not a very good one either. The vapor of chloroform rapidly kills them, so that by putting a small quantity of chloroform in a gallipot on the top of the infested cantharides, the heavy vapor will sink through it and destroy them.

NOTE.—The essay was accompanied with specimens of the larvæ, skins and beetles, mounted for examination by means of the microscope.

#### THE PARASITE OF PHYLLOXERA VASTATRIX, AND THE GALL INSECT OF THE NETTLE TREE.

BY REV. THOMAS W. FYLES, COWANSVILLE, P. Q.

Upon request, I sent to Dr. H. A. Hagen specimens of the parasite of the Phylloxera, *Diplosis* (?) *grassator*. At the same time I sent him specimens of the *Psylla* described on page 198 of vol. xiv. Dr. Hagen favored me with information as follows:—

"The fly is a *Cecidomyia*; I think it is not sure that it belongs to *Diplosis*. At least the reticulation of the wing differs in having the

median vein straight, and the fork at the hind margin wanting. You will see in Osten Sacken's Catalogue that the museums do not possess this type for *Cecidomyia*. I have gone through the literature, and find till now your species is not described. The larva is shrivelled up, therefore the trophi are not visible.

"Your other insect is *Psylla venusta*, O. Sacken, raised by him, and described with its galls on *Celtis occidentalis*.—Fettiner Entom. Zeit., 1861, p. 422."

With regard to the *Psylla*, Mr. Fletcher's note in the February number reminds me that I ought to have mentioned that I found *Celtis occidentalis* at Como, in Vaudreuil Co., in the grounds of Mr. I. J. Gibb, with whom I spent some time last year. I have not met with the tree at Cowansville.

In Mr. Ashmead's list of described Psyllidæ, on page 222, vol. xiii., there is no *Celtidis-mamma*. And the doubt remains whether the *Celtidis-mamma* of Prof. Riley is not the insect previously described by Osten Sacken under the name *venusta*. Professor Riley seems satisfied that they are distinct species; and it would be pleasing if we could regard him as infallible.

Where does the Professor obtain the word *Celtidis*? The generic term *Celtis* is obtained from the name of the African lote-tree, mentioned by Pliny, H. N. xiii., 17 in § 32: "Africa arborem loton gignit quam vocant celtin et ipsam Italiæ familiarem." *Celtin* indicates *Celtis* as the genitive, and not *Celtidis*.

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#### MR. JOHN B. SMITH'S PAPER ON N. AM. HELIOTHINÆ.

BY A. R. GROTE, A. M.

For my part, I am very glad that a plate of tibial structure has at last been published, and by Mr. Smith. It illustrates characters upon which I have long insisted, and is a valuable addition to the present "Synopsis." The second plate might well have been omitted; it hardly assists the student, and is badly drawn. The "Synopsis" itself is a gratification to me; it is scientifically written so far as the characters it discusses are concerned. Its difference from my own work in its conclusions are more apparent than real. Mr. Smith writes with a critical eye to my shortcomings, and really finds very little to say.

He quotes at some length a former statement of mine as to the spinose tibiae (made ten years ago), which I at once corrected on examining again the small insect under a larger lens. - But he excuses other modern writers with worse mistakes to father. In stating the case fairly, he should have said that although Mr. Grote has been the first American to insist on the natural characters of spinose tibiae, yet once he called the tibiae unarmed, where they were really spinose, but he promptly corrected the mistake. Mr. Smith calls my citing *Rhododipsa volupia* hardly "honest," while he suppresses the fact that I twice described the moth as probably Fitch's species, but Fitch's description, as I explained, will not fit my insect (figured in Illustrated Essay). In my list I only did to this *one* what LeConte did throughout, viz., cite the authority for the combined terms. I differ from Mr. Smith as to the generic characters, and I desired to show that no new specific name was necessary, even if my species was not Fitch's. With regard to the species, there is little variance with regard to their validity. The synonymy is mainly that of my Lists. I do not believe that *persimilis* is the same as *villosa*; at the same time I readily admit that *balba* and *acutilinea* may be color forms of *separata*. Speyer considers, as I do, that *angulata* is distinct from *umbra* (= *exprimeus*). Mr. Hy. Edwards informed me long ago that *sucta* and *Californiensis* were varieties. The statement made by Mr. Smith that I resurrected *Trigonophora* from Hubner, is incorrect. I took the genus from Lederer and Staudinger. I cannot understand why it is that *Schinia* Hubn, which I did "resurrect," is made to supercede my genera; but I scarcely think that any one will call all the species "*Schinia*," that Mr. Smith puts under that genus. I can assure Mr. Smith that my little *limbalis* is not related to Mr. Edwards' *constricta*. From a small unset specimen I established the genus *Epinyetis*, without knowing of Mr. Hulst's description of the moth as *magdalena*. The two, as Mr. Hy. Edwards has told me, are the same. My specimen was very poor, and I have it no longer to again go over its characters, which are, I believe, correctly given by me. The collections I have determined will allow of every certainty as to my species, but I hope that my labels will be respected and not changed, as it is probable that Mr. Smith's work will be modified. It is interesting as the first attempt to review from a scientific standpoint the material brought together by myself, and which there was frequently no opportunity to compare at the time of the original description of the species and genera.

*SCHINIA* Hubn. (1818).*Type*: *S. Trifascia* Hubn.

The fore tibiae are short and stout, on the inside with a longer terminal claw followed by two unequal spinules; on the outside and shorter edge with two smaller sub-equal claws, the second the shorter, and a third, farther removed, between a spinule and a claw, a short broadish spinule. Front bulging, narrowly scaled, with infra-clypeal plate, no frontal tubercle. Eyes naked, unlashd; ocelli. Labial palpi slender. Vestiture mingled scales and hair. Middle and hind tibiae spinose. Abdomen untufted.

Neither *Rectifascia* nor *Gulnare*, which resemble each other in markings, probably belong here; the latter I have never seen; the only specimen of the former which I found in Mr. Neumoege's collection has the legs defective, the tibiae not being spinose as far as I can see. The student is referred to my List (1874) for the types of the North American genera of Noctuidae.

*LYGRANTHOECIA* G. & R. (1873).*Type*: *Anthoecia Rivulosa* Guen.

Fore tibiae with fine spinules on the inside, which is furnished with two sub-equal claws; on the outside with a succession of four in diminishing series from the end of joint. Tibiae spinose. Vestiture mixed scales and hair. Eyes naked, unlashd. This genus differs by the armature from *Schinia*, but the frontal structure is the same. I may be wrong in considering the variations of tibial armature to be of generic value. I was at work on Mr. Neumoege's collection, and had reached in part similar conclusions with Mr. Smith, who uses exactly the characters I do. It is a mistake to suppose I had reviewed all the genera in my List. I merely gradually added the new forms. I shall again refer more fully to Mr. Smith's interesting paper.

NEW SPECIES AND NOTES ON STRUCTURE OF MOTHS  
AND GENERA.

BY A. R. GROTE, A. M.

(Continued from Vol. xv., Page 31.)

*VANESSODES FUSCIPES*, n. s.

♂. Allied to *Clarus*, but the body entirely griseous, concolorous with the fuscous gray wings, which are sub-diaphanous and differ only from

those of *Clarus* by being a little wider, more irrorate and dusted by dark scales. Same size as *Clarus*, but easily separated by the abdomen not being yellow. One specimen. Coll. B. Neumoege, Esq. Arizona. The antennæ are not so heavily pectinated. There are no perceptible marks on the wings, which are not exactly of the same shade as those of *Clarus*, being more grayish.

CYMATOPHORA (BOARMIA) DEPROMARIA, n. s.

♂. While *C. Dataria* resembles our Eastern *C. Larvaria* in the course of the outer median black line, *Depromaria* has it more oblique and straighter, more like *Pampinaria*, and this new species is much smaller, but of the same form as *Dataria*. Pale gray with the discal ringlets small. Lines narrow, black; outer line followed by a brown band, diffuse and even inferiorly, opposite cell, waved. S. t. line whitish, scalloped. Inner median line and median shade and outer median line running close together, a little confused and sub-parallel inferiorly at the middle of the wing, owing to the obliquity of the lines and the projection of the inner line. Hind wings like primaries, the mesial lines divergent superiorly, the outer followed by a brown shade. Body gray; a mark on collar. Beneath the wings are paler, mottled, without lines and the four dark discal dots perceivable. *Expanse* 26 mil. Arizona.

In ♂ *C. Dataria* the body is stouter, the mark on collar plainer, the disk of thorax somewhat blackish or smoky. The t. p. line is thicker, everywhere distinct, running obliquely outwards and downwards opposite the cell, below which it is sinuous, projected about veins 2 to 3; the brown shade is also uneven; the discal spot is larger on primaries, white, narrow and long; the scalloped s. t. line is more distinctly white on both wings. Beneath pale gray with a thick mark on fore wings and a very slight one on secondaries; there are traces of darker transverse lines. *C. Dataria* expands 30 mil. In this latter the fine median shade is sharply angulated beyond the discal ringlet. I do not think it will be difficult to separate these two Western species from their congeners.

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PAPILIO WALSHII AND ABBOTII, EDW.

BY A. H. MUNDT, FAIRBURY, ILLS.

There seems to be a great lack of historical knowledge about the above insects in this State, at least as far as my observations are concerned. In

several collections, even in that of the State Normal, have I found *Papilio telamonides* labeled *Walshii*; this, however, was in the year 1878 and '79.

Subsequent observations will show that it is no wonder that this insect has escaped the notice of many of our best collectors.

Late in March, 1878, while walking through a thirty-five to forty-acre Pawpaw grove, near Pontiac, Uls., one bright and sunny morning, the ground being thinly covered with snow, which was rapidly disappearing under the influence of the sun's genial warmth, Mr. W. H. Story and myself were surprised to see a *Walshii* flying up; but the air being cool, it soon alighted and was taken by us, a perfectly fresh example. In the afternoon two more were taken, and on every bright day up to near the middle of May we could have taken fresh examples of *Walshii* and *Abbotii*; after that *telamonides* made its appearance and *Walshii* became scarce, but I might mention here that in every five examples I have ever taken, at least two were *Abbotii*.

In 1879, the river had flooded this entire ground, and not one of the latter insects were found by us there; but, on a high piece of ground some three miles from Fairbury, I found Pawpaw timber in patches scattered here and there for over a mile, where I took a few specimens of the latter two varieties, but they were very scarce, and most of those taken later on were *telamonides*.

In 1880, Mr. Story saw and took several of these *Papilios* at Pontiac, and I took quite a number, but they did not appear then until early in April. A remarkable connection between *Walshii* and *telamonides* was observed that year, more than before or since; at least half of the first that appeared were in size and wings real *telamonides*, but the tails were decidedly *Walshii*, and in some of these the tails were in length and shape like *telamonides*, but had the end only tipped with white, as in *Walshii*. *Abbotii* too were as much mixed, and the greatest variations in the extent of the red stripe on the upper secondaries existed in them. On writing these observations to Mr. Edwards, he decided that all of those with the least red on secondaries, forming a stripe, must be *Abbotii*, and suggested that I should publish my observations.

It will be remembered that during the winter of 1879 and 1880, the snow fell heavily and lay all winter until the warm spring rains melted it; and though it was bitterly cold that winter, the ground where the snow had laid had not been frozen. This might have had some influence on the above variations.

The spring was very late that season when most of these *Papilio*s appeared; the buds were just beginning to show signs of forthcoming leaves, but on these and the branches were deposited numbers of eggs, chiefly on the latter. It is rare to find any on the branches when the leaves are well out.

In 1881, the Vermillion River again overflowed the grounds at Pontiac, but the closest observations here at Fairbury, and at Pontiac, failed to show us a sign of *Walshii* or *Abbotii*; even *telamonides* was very scarce that season, but *marcellus* was quite plentiful from late in May throughout the season, but were much smaller at first than those of previous seasons or those coming later.

In 1882, the weather was very unfavorable for these insects, and but few *Walshii* were seen. Mr. Story took a few at Pontiac, and I secured several about the same time; even the most common form, *marcellus*, was very scarce. I visited quite a number of Pawpaw groves, including the extensive bottoms near the Illinois River, but I could see no signs anywhere of larvæ until the latter part of the season, when I found eggs on the young leaves of their food plant, and after that the leaves showed here and there where the larvæ had been at work, which in previous seasons could be seen throughout the warm weather.

Mr. W. H. Edwards had written me two years before this, saying that "the late Benj. D. Walsh had told him, before his decease, that the butterfly named in honor of him was not found in this State," and Mr. E. expressed the opinion that it was because no one had discovered how or when to look for it.

It is therefore no wonder that this insect should have escaped the notice of other collectors, when such an enthusiast as our honored and lamented Prof. B. D. Walsh failed to find it.

The parasites I have found infesting *P. ajax* are a black ichneumon fly, rather large, belonging to the genus *Anomalon*, and another, perhaps a little smaller than the above, with a yellowish brown body and black shiny wings, *Trogus exesorius*, Brull., species kindly identified for me by Prof. C. V. Riley.

OBSERVATIONS ON ANTHRENUS VARIUS FAB., ANTHRENUS  
MUSÆORUM LIN., TROGODERMA ORNATA SAY,  
AND SITODREPA PANICEA LIN.

BY JOHN HAMILTON, ALLEGHENY, PA.

*ANTHRENUS VARIUS Fab.*—Entomologists generally are well enough acquainted with the appearance of this insect, and but too well with the work of its larvæ; but as to the time required for its development there is not the same unanimity of knowledge,—some stating that it requires a year for its various transformations; others, that only a few weeks are necessary. The following is my experience: May, 1879, I placed a female in a paper collar box with some refuse Coleoptera and Lepidoptera. This box stood on the mantel-piece in my office, and consequently the temperature was nearly uniform summer and winter. An examination two months afterwards revealed several small larvæ. These were inspected monthly, and appeared to have attained their growth by the 1st of December, though they remained active during the winter. The first pupæ were observed March 5th, and the first beetle on the 26th. From that time to May 1st thirty-five developed in all,—the product of this one beetle. Three females and two males were left in the box, and six weeks afterwards young larvæ were observed. They were inspected monthly, and followed the same course as observed the previous year. From April to May, (1881), seventy-five beetles were taken from the box. How many were left is unknown. The box was closed, and several months afterwards was found to be inhabited by countless multitudes of half-grown larvæ. These disclosed, as before, during the following April, (1882). The beetles and cast-off larvæ skins nearly filled the box, and the original food was reduced to a powder. They were numerous enough to have supplied all the cabinets on the globe. Box and all were consigned to the flames. This experiment shows that this insect is moderately prolific; that it is annual, at least in this instance; that it does not require water; that it can be propagated indefinitely without the male and female resorting to the open air, or tasting the sweets of flowers; and that the larvæ do not seek to escape from confinement by gnawing out. Experimenters should use two close fitting telescopic boxes of different sizes, one within the other, so as to prevent any possible escape of the larvæ.

**ANTHRENUS MUSÆORUM** *Lin.* (*Castanea* Mels.).—This beetle is abundant in May and June on many flowering shrubs, especially *Spiræas*. In May, 1881, also in May, 1882, a number of these beetles were placed in a box containing refuse insects, as had been done with *Varius*; but in neither year did larvæ appear. In Europe this beetle has a bad record as a museum pest, (hence its name); but in this country I have seen no notice of such a habit. If *Musæorum* and *Castanea* are identical, it is strange how its taste has changed so completely; and it would be interesting to know whether it has been imported, or is a native of both continents. In the latter case its European taste for natural history has probably been acquired. However, may they not really be different species having forms so nearly identical that the anatomical differences of structure have not yet been observed, as was the case formerly with several much larger beetles, notably several species of *Lachnosterna*, *Cyllene pictus* and *robinia*, &c.?

Further experiments are contemplated with this species.

**TROGODERMA ORNATA** *Say*.—April, 1879, found a full grown Dermestoid larva in a large insect-proof show case in my office. Length, 6 mm.; shape, elongate, fusiform; color, pale, except last three dorsal segments, blackish. Placed it in an empty wooden box that had contained petroleum ointment, giving it a couple of insects for food. Monthly inspection showed that it ate nothing; that it moulted frequently and became smaller. It died July, 1880, having shrunk to one-fourth its original size. Fifteen skins, some of them exceedingly thin, were taken from the box, showing that it had moulted once a month. In May, 1881, five full grown larvæ, corresponding to the above, were found in the same case, having evidently lived on flies that had entered at such times as it had been opened. These were placed in a new ointment box, turned from poplar (*Liriodendron tulipifera*), the sides of which were one-eighth inch thick. Inspecting them two weeks afterwards, two were found to have escaped by gnawing oval holes through the sides of the box close to the top. The third had almost completed another hole, while the remaining two had not commenced operating. These three were placed in the petroleum ointment box above mentioned, and made no attempt to gnaw out,—the petroleum probably rendering the wood unpleasant to their taste. Seeing that they moulted as the former had done and that they were not likely to develop, they were placed in a wide mouth bottle

containing some fresh clay, and corked up. They at once entered the earth, and in sixteen days, (June 20th), appeared as beetles, proving to be *Trogoderma Ornata*—all females. From these experiments it appears that this insect is annual; that the larvae enter the earth to develop, and that to escape from confinement for this purpose they have power to gnaw through a considerable thickness of wood. And further, that in case they are prevented from entering the earth, unlike the larvae of many Lepidoptera, they do not pupate, but continue to moult monthly for an indefinite period, perhaps a year, before dying.

SITODREPA (*Anobium*) PANICEA Linn.—This insect appears to be omnivorous. Rev. Wm. Kirby states that its larva has been found in *Cantharis vesicatoria*; Dr. Geo. H. Horn, that it will breed in and destroy the cork in insect boxes. That it is likely to become more than an accidental museum pest is scarcely probable. But where so circumstanced as to be compelled to choose between cork and insects, the latter are most decidedly preferred.

My boxes are double, and lined with half-inch cork, which before papering is saturated with an alcoholic solution of corrosive sublimate. One box having escaped this treatment, on opening it last spring (1882), several of these beetles were found, having been bred in the cork. They were removed, and on one side of the box were pinned against the bottom several cards with duplicate beetles attached; the other was occupied by larger specimens mounted on pins.

During the summer, whenever opened, a number of the insects in question were picked out. About a month ago, on removing the duplicates, so as to treat the cork with the poisoned alcohol, the discovery was made that they were infested with the larvae of *Panicea*, and completely destroyed. The larger beetles sometimes contained five or six grubs, each. They were in all stages of growth, from pupæ to larvae apparently just hatched. The time required for development is unknown, but there seems to be at least two broods in the year in confinement. It may not, like *Anthrenus*, enter a collection from an appetite for insect food; but if imprisoned without way of escape, my experience shows the result will be the same.

American Natural History literature is somewhat barren in regard to such a common and obtrusive pest.

Say describes it by the name *Anobium tenuestriatum*, Say's Ent. Lec. Ed. ii. p. 281. He says it is common, frequently occurs in museums, is destructive to Iris root of the shops, and to various farinaceous substances. Melsheimer describes one of its forms by the name *An. obseum* [obesum], without remarks. Proc. Acad. Nat. Sci. v. ii., p. 309. LeConte says, "It has been introduced from Europe in flour, bread and other articles of commerce, to all parts of the globe," ib. 1865, p. 229. Packard mentions it as parasitic on *Humble Bees*. Guide to the Stud. Ins. p. 131; and at p. 471 figures the pupa and describes the larva. Mr. Townsend Glover, (Agricultural Rep. 1854, p. 72), represents it as occurring in all its stages and in great abundance in soft wheat from Algeria, "several larvæ sometimes found inhabiting the same grain." And on plate (5) figures the larva, pupa and perfect insect. I know of no other notices, except that of Dr. Geo. H. Horn, referred to above.

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NOTES ON THE TINEIDÆ OF NORTH AMERICA,  
BY LORD WALSHINGHAM.

(From the Trans. Am. Ent. Soc., Philadelphia.)

BY MARY E. MURTFELDT, KIRKWOOD, MO.

Through his Lordship's kindness, I have received, with much pleasure, a copy of the above named *brochure*. From such examination as I have been able to give it, it seems to me by far the most valuable of recent contributions to the literature of American *Tineidæ*, and places all students of this beautiful group of the "Micros" under special obligations to its distinguished author.

The material examined in the preparation of these "Notes" consisted mainly of the loaned collections of Profs. Fernald and Riley, that of the Peabody Academy of Sciences of Salem, Mass., of Mr. Goodell, of Amherst, Mass., and a small contribution by the present writer. Each of these lots contained some of Mr. Chambers' types. The only American collections of any note which were not represented were those of the Harvard Museum at Cambridge, Mass., and the Clemens' types at Philadelphia. Of the latter, however, Lord Walsingham had full notes made during his visit to this country in 1872.

The result of the author's critical study of the specimens thus accumulated, has been the rectification of the synonymy of a large number of species, the characterization of one new genus, *Eulepiste*, and the description of twenty-four new species, some of which had been confounded with others previously described.

Clemens' genus *Anaphora* is required to give place to the earlier generic name *Aerolophus* of Poey, to which Walker's genera *Zaruma*, *Ubara* and *Naharra*, and Hübner's *Pinaris* are all nearly allied forms. One new species, *A. simulatus*, Wlsm., is described. Lord Walsingham acknowledges special indebtedness to Mr. Chambers' "Index" and descriptive work, but in his study of the species before him thinks it advisable to discard one or two of the latter's genera, such as *Harpalyce*, *Dryope*, etc., and identifies a considerable number of his species with those of Dr. Clemens and various European authors whose descriptions antedated his.

Concerning some of these eliminations, I am permitted to quote from a letter recently received from Mr. Chambers. With the prefatory remark that "Entomologists, like doctors," will differ "sometimes, and while in the main concurring in his Lordship's opinions, as expressed in the pamphlet under consideration, I feel bound to dissent from a few of his conclusions—a few only—though his more recent familiarity with the species entitles his opinion to much greater weight than mine," Mr. Chambers refers to the species as follows:—

"If my *Tinea cæmetariæella* is Clemens' *Eudarcia simulatricella*, I see no *raison de être* for the genus *Eudarcia*. I find no greater differences between the neuration of *cæmetariæella* and other undoubted *Tinea*, than there are among the latter themselves.

"Lord Walsingham remarks that the specimen of *Depressaria applanata*, Fabr., in Prof. Fernald's collection, is labelled *Gelechia Clemensella*, Cham., *salicifungiella*, Cl., but I don't think it was so labelled by me. Lord W. is mistaken in saying that it is omitted in my 'Index' (though the reference is incorrectly to vol. 9, Can. Ent., instead of to vol. 8), and I say that it appears in some respects to resemble *salicifungiella*.

"I still think my genus *Harpalyce* distinct from *Cryptolechia*, and in a letter to Lord Walsingham I have stated some of my reasons for this opinion."

Mr. Chambers is not prepared to agree with Lord Walsingham that his *Gelechia prunifoliella* is identical with his *Phætusa plutella*, nor that

*G. crescentifasciella*, Cham., and *G. grissefasciella* are different forms of the same species, although he does not question that the former may be equal to Walker's *G. conclusella*. Mr. Chambers further says that he "was never able to reconcile his *G. rubensella* with Clemens' *G. rubidella*," from which Lord Walsingham remarks that *he* is unable to separate it. These two (?) species belong to a group in which there is considerable variation in coloring, and in which the specific distinctions are evidently slight in the imagines, though sufficiently well marked in the larvæ, as I judge from the three or four forms that I have succeeded in rearing.

As to *Helice gleditschiælla*, Cham. (= to *pallidochrella*, Cham., according to Lord Walsingham), Mr. Chambers says: "The defect in the description of the hind wings, to which Lord Walsingham calls attention, may exist and may have been caused (as I have known similar mistakes in other cases) by a slight fold or wrinkle under the tip. I have an indistinct recollection that I observed something of this in this species. I placed this species in *Gelechia* in the 'Index' for the reason stated on page 124 of that publication, and it may be that I never gave any other description of it as a *Gelechia*. \* \* \* \* The reference in the 'Index' noted by Lord Walsingham, and occurring in various places, to Can. Ent., vol. x., p. —, was intended to apply to a paper which I thought I had sent to the Can. Ent. for publication in that volume. But I suppose it was never sent, or it was lost in the mail. \* \* \* \*

"From my bred and captured specimens of *Gracilaria superbifrontella*, Clem., oak-feeding, and *G. Packardella*, Cham., maple-feeding" (according to Lord Walsingham, identical, and equal to *G. swederella*, Thnb., whose name has precedence), "I think the species are distinct (though I have had doubts about it), and that both are distinct from *swederella* as described and figured in Nat. Hist. Tin."

In regard to *Coleophora leucochrysella*, Clem.—to which species Lord Walsingham relegates Mr. Chambers' *C. argentella* and *C. argentialbella*—Mr. Chambers says: "In a flying trip through Philadelphia, a year or two ago, I glanced at a part of the Clemens' collection, and the one thing that I recollect (for I made no notes) is that *C. leucochrysella*, Clem., is the proper name for *C. albella*, Cham. *C. argentialbella* is a different insect and smaller."

These quotations embody the most important of Mr. Chambers' differences from Lord Walsingham's opinions, and I have taken the liberty of transcribing them because I think they will be of interest to others beside

myself, and because Mr. Chambers informed me that he should not himself publish them. In all other points Mr. Chambers agrees to the value and unquestionable authority of Lord Walsingham's determinations.

In the choice of specific names, it will be observed that his Lordship does not restrict himself to the termination *ella*, as witness his *Cressoni*, *simulatus*, *inornata*, *inscripta*, etc. While it is a great convenience, to the tyro especially, to have a conventional termination for the specific names of all species constituting a certain family, such as *ella* for the Tineids, *ana* for Tortricids, and *alis* for Pyralids, there is no doubt that strict adherence to such a rule sometimes puts the author to inconvenience, and often necessitates more than a "poet's license" with grammatical rules.

In a future paper I shall have occasion to refer to a few of Lord Walsingham's new species in connection with their life histories.

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## ENTOMOLOGY FOR BEGINNERS.

BY THE EDITOR.

### *THE APPLE-TREE APHIS*—*Aphis mali*? Fabr.

This species of *Aphis* is very common throughout the Northern United States and Canada, and has of late appeared in such numbers in some localities as to excite much alarm among fruit growers. The eggs are deposited by the parent lice in the autumn, about the base of the buds of the apple tree, and in crevices of the bark on the twigs. When first laid they are light yellow or green, but gradually become darker in color and finally black. During the winter these tiny, oval, shining black eggs may be found with the aid of a magnifying glass on almost every apple tree.

As soon as the buds begin to expand in the spring, small lice are hatched from these eggs, which locate themselves on the swelling buds and young tender leaves, and inserting their sharp beaks into the tissues, feed on the sap they contain. The lice vary in color from green to dark greenish-brown, the darker color prevailing at first, the lighter color in a few days afterwards. When they are abundant, the buds—especially the blossom buds—are sometimes thickly covered with them, yet it is seldom that any serious injury results from their attack. The growth at this

period of the year is so rapid, and the sap circulates through the branches in such abundance, that the comparatively small quantity consumed by these plant lice seems scarcely to be missed. In a few days the young leaves expand, when the insects are distributed over the foliage, and usually attract no further notice.

All the lice hatched in the spring are females, and they reach maturity in ten or twelve days, when they commence to give birth to living young, producing about two each every day for two or three weeks, after which the older ones die. The young locate about their parents and mature in

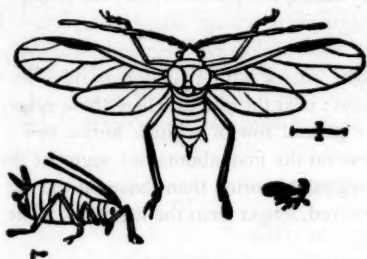


Fig. 5.

ten or twelve days, when they also become mothers as prolific as their predecessors. As the season advances some of the females acquire wings, by means of which they fly to other trees, where they found new colonies. In figure 5 both winged and wingless specimens are shown much magnified. Late in the autumn males, as well as females, are produced,

and the work of the year closes with the deposit of eggs as already described. Were it not for the activity of Lady-birds and other useful predaceous insects, which appear early upon the scene and devour multitudes of these lice, they would soon swarm on every leaf of our apple trees and become a source of serious trouble.

#### NOTES ON THE EARLY STAGES OF CALOPTERON RETICULATUM, FABR.

BY D. W. COQUILLETT, WOODSTOCK, ILL.

On the 10th of July I found a pupa of this species suspended by the hind end of its body beneath a log. The larval skin was rent and worked backward, but still retained nearly its original shape and color, and by comparing it with certain larvæ which I have frequently met with in similar situations, there is no doubt in my mind but that these latter belong to the above species.

These larvæ very closely resemble that figured by Packard on page 465 of his "Guide" (fig. 432), which in the text on the succeeding page is referred to *Photuris*. The dried specimens now before me measure

about 12 mm., and are of a dull purplish-brown color; venter pale yellow, tinged with pink and marked with a brownish stripe on each outer edge, and with two rows of brown spots, these not extending upon the first three segments; head retractile, dull blackish, the region of the jaws polished brown, and furnished with four black prickles, the upper two of which are placed transversely, the lower two longitudinally.

The pupa mentioned above tapered quite regularly from the head to the tail, and was of a blackish color, shaded in places with whitish; segment one flattened above, and on each outer edge, near the anterior end of the segment, are two white, fleshy horns, the posterior ones the longest; on each posterior angle of this segment is a long, white horn, curved backward; on the anterior part of each abdominal segment is a sharp transverse ridge, which unites at right angles with a subdorsal ridge that extends lengthwise across the segment; near the places where these ridges meet is a low whitish tubercle; a stigmatal row of whitish horns, two to each segment, curved forward, those on the first abdominal segment the longest, those on each succeeding segment shorter than those on the segment preceding it; antennæ-cases curved, longer than the leg-cases, white, marked with black; length, 13 mm.

The beetle issued from the above pupa on the 21st of July, and was of the variety *terminale* of Say.

#### THYRIDOPTERYX EPHEMERCEFORMIS, HAWORTH.

BY FREDERICK CLARKSON, NEW YORK CITY.

By the kindness of Mr. Donnelly, the very efficient head gardener of the Central Park, of this city, I am put in possession of sixty cocoons of the "Basket-worm." They were taken from the terminal twigs of a sapling Sycamore Maple and Horse Chestnut growing on the low land in the immediate vicinity of the zoological garden. The cocoons hung in clusters on every twig, and as they had excited considerable curiosity, the gardener permitted them to remain until about the period of egg-hatching. I have supposed it might be of interest to the subscribers of the CANADIAN ENTOMOLOGIST to have the result of my examination of these cocoons. Ten of them had been occupied by the male, as attested by the puparium within. In about an equal number I found the broken shell-case of the female, all else having been devoured by parasites, some of which, in pupa condition, were found within the cocoons. The remainder of the cocoons

contained the long larva-like puparium of the female, fastened at either end with stout silken bands to the side of the cocoon. The thoracic portion of the puparium, upon being slightly pressed, separated in atoms, and the downy substance with which it had been filled floated away in the air like dust; the abdominal portion of the puparium contained from fifty to eighty soft yellowish eggs. It has been thought by some of our Entomologists that the eggs are deposited among the silken threads in the upper part of the cocoon, and by others that they are not extruded from the body of the parent, but that the moth dies retaining them. Later investigation, however, has shown that they are deposited within the puparium, a fact clearly demonstrated by the observations that I have made. The very unusual method as displayed by this moth for the protection of its ova, is probably attributable to the fact that the shells are singularly tender, and as the slightest touch would make a jelly of the whole deposit, this extraordinary provision is made necessary.

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### CORRESPONDENCE.

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#### LAST YEAR'S COLLECTING.

The connection between the weather and insect life is an interesting subject, but one that requires a vast amount of observation before any conclusions of much value can be reached. We are all familiar with the relation of the weather to the crops, but insects seem more dependent on favorable weather than vegetation is. The first part of a season may be very injurious to vegetation, whilst later on a favorable change may occur and it will recover all it lost and even exceed an average; but with insects, if they have been seriously interfered with in the early part of their career the result is generally fatal to the bulk of them for that season. This is undoubtedly one of nature's methods for preventing excess. Ontario alone has a varied range of climate, and what is said of one section will not apply to others. Vennor considers Hamilton and neighborhood endowed with a climate peculiarly its own, and the verdict of concurrent opinion is favorable. But whether it was the open winter or the long continued cold of spring, certain it is the summer of 1882 was rendered remarkable by the absence of Diurnals; even those least observant remarked it. *Pieris rapae* appeared early, and then disappeared almost entirely until quite late in the season. I did not see half-a-dozen *Archippus* the whole summer. The milk weeds stood in

unbroken leaf until late in the fall, when they were taken possession of by extensive broods of *Euchates egle* larvæ. Even Skippers were scarce, and it was quite a treat to see a *Philodice*. On the 23rd of June I took for the first time here a *Terias lisa*, and there was not another yellow butterfly to be seen in the field. If *Philodice* had been plentiful I might not have noticed it. The Noctuids generally were scarce, and there was a noticeable absence of cut worms in both field and garden. There were but few species of *Catocala* abroad, and these not plentiful, except *Habilis*, which was so abundant as to be offensive. To our delight the highly attractive *Relicta* appeared in goodly numbers, which it was never known to do here before, and three dozen of them were secured. In fall moths a few good things were taken, but not in any quantity. In beetles, *Carabidæ* were scarce; wood borers were moderately plenty, but they were very late and straggling in appearing. Taking the season all through, it was not one of much success for collectors.

J. ALSTON MOFFAT.

GREAT ABUNDANCE OF PAPILIO (THQAS) CRESPHONTES.

This large species of Swallow-tail swarmed here last summer. My friend, Mr. Gilbert, Mr. Allis, and myself, took about 300 larvæ. There are two broods. Its chosen food here seems to be the prickly ash. The young larvæ have the slimy, slug-like appearance characteristic of young *troilus*; indeed the two species resemble each other somewhat before the first moult. Why this fine species, which in times past has been very rare, should appear in such large numbers, is one of the events in the life of insects not well understood.

LARVA OF CATOCALA MESKEI.

Color light drab or cream. Head bi-lobed, ringed in front by a narrow, dark brown line; extremity divaricate. Between the fifth and sixth segments is a light brown band. An elevated band of obscure brown occurs on the seventh segment. Under side blackish brown. Length  $2\frac{1}{2}$  inches.

This larva is much more uniform in color than any other *Catocala* larva I have met with. Its chosen food is the poplar, and I may add by way of a hint to those who are desirous of getting *C. relictæ*, that the poplar is the favorite food of this dainty moth. Last season four perfect specimens were taken, all on the poplar; one male was very dark and beautiful. This season five were taken from the same source, among them a dark female.

ROBERT BUNKER.

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